

CLAIMS:

1. A method of manufacturing a semiconductor device (10) comprising a semiconductor body (100) of silicon with a bipolar transistor including a base (1), an emitter (2) and a collector (3), wherein the emitter (2) is formed in a first region of the semiconductor body (100) and wherein an electrically insulating layer (13) is formed on the semiconductor body (100) in which a window is formed in the first region of the semiconductor body (100) and a semiconductor layer of silicon (14) is deposited on the insulating layer (13) which fills the window in the insulating layer (13) and which extends laterally over the insulating layer (13) along the window and after the deposition of the semiconductor layer (14), the semiconductor layer (14) and the insulating layer (13) are removed in a second region of the semiconductor body (100) which borders the first region which is covered by a stack comprising a remaining part of the insulating layer (13) and a remaining part of the semiconductor layer (14) and hereinafter a metal layer (16) is deposited on top of the remaining part of the semiconductor layer (13) and on the second region of the semiconductor body (100) of silicon and a silicide (17) is formed between the metal layer (16) and the second region of the semiconductor body (100) of silicon and between the metal layer (16) and the remaining part of the semiconductor layer (14) of silicon, and wherein a side face of the stack is provided with means to avoid bridging of the silicides (17) to be formed, characterized in that the means to prevent bridging of the silicides to be formed comprises that the side face of the stack is structured in such a way that the distance between the upper surface of the remaining part of the semiconductor layer (14) and the upper surface of the second region of the semiconductor body (100) along the surface of the side face of the stack is made longer than the total thickness of the insulating layer (13) and the semiconductor layer (14).
2. A method according to claim 1, characterized in that the removal of the semiconductor layer (14) and the insulating layer (13) in the second region is done by an etching process such that the side face of the remaining part of the insulating layer is made convex and extends viewed in projection outside the remaining part of the semiconductor layer (14).

3. A method according to claim 2, characterized for the etching process a dry etching process is used with chemistry based on fluor and carbon compounds.
- 5 4. A method according to claim 1, characterized in that the removal of the semiconductor layer (14) in the second region is done by an etching process such that the side face of the remaining part of the semiconductor layer (14) is made concave and extends viewed in projection inside towards the remaining part of the insulating layer (13).
- 10 5. A method according to claim 4, characterized in that a first upper part of the semiconductor layer (14) is etched by using an anisotropic dry etching process and a second, lower part of the semiconductor layer (14) is etched using an isotropic etching process.
- 15 6. A method according to claim 4, characterized in that the semiconductor layer (14) is provided with a doping profile such that a lower part (14A) of the semiconductor layer (14) has a high doping level and an upper part (14B) of the semiconductor layer (14) has a low doping level and the difference in doping level between the parts (14A,14B) is used to form the desired concave side face of the remaining part of the semiconductor layer (14).
- 20 7. A method according to claim 6, characterized in that after an anisotropic etching process of the semiconductor layer, the side face of the remaining part of the semiconductor layer (14) is thermally oxidized and subsequently the resulting oxide is removed by a wet etching agent based on HF.
- 25 8. A method according to any of the preceding claims, characterized in that the remainder of the insulating layer (13) and the remainder of the semiconductor layer (14) and a layer on top thereof are used as a mask for doping the second region of the semiconductor body (100).
- 30 9. A method according to any of the preceding claims, characterized in that the base (1) is formed by providing the semiconductor body (100) with a doped further semiconductor layer (12) which locally borders on a monocrystalline part of the semiconductor body (100), thereby forming a first semiconductor region which is monocrystalline and which constitutes the base (1) of the transistor and which further

semiconductor layer (12) borders at locations outside the base (1) on a non-monocrystalline part of the semiconductor body (100) thereby forming a second semiconductor region which is not monocrystalline and which constitutes a connection region (1A) of the base and the collector (3) is formed by a further part of the semiconductor body (100) situated below the
5 base (1).

10. Semiconductor device (10) with a bipolar transistor with a base (1), an emitter (2) and a collector (3) in a semiconductor body (100) of silicon and having above the emitter (2) an insulating region (13) with a window which is filled with a semiconductor region of
10 silicon (14) which extends over the surface of the insulating region (13) and with silicides (17) formed on top of the silicon region (14) and on top of the semiconductor body (100) on both sides of the insulating region (13), characterized in that the side face of the stack formed by the insulating region (13) and the silicon region (14) is structured in such a way
15 that the distance between the upper surface of the silicon region (14) and the surface of the semiconductor body (100) along the surface of the side face of the stack is made longer than the total thickness of the insulating region (13) and the silicon region (14).